These Iowa specimens of *Chrysobothris* average a little larger and the elytral foveae are more distinctly bronzed or metallic than those from New York and Massachusetts in Professor H. F. Wickham's collection.

There are, perhaps, two things of particular interest in regard to this experiment: first, the great number of *Lepturges querci* secured from a comparatively small number of twigs indicates a very high degree of infestation; second, in the rather limited number of *Chrysobothris azurea* obtained the males averaged a little earlier in emergence than the females. This is, however, not an unusual occurrence among other species of Coleoptera. I believe also that *Wistaria chinensis* has not been recorded as a host plant for either of these species of beetles.

I am indebted to Professor H. F. Wickham for the determination of the *Chrysobothris* and to Professor R. B. Wylie for the determination of the *Wistaria*.

Fragments on North American Insects—VIII.

By A. A. Girault, U. S. National Museum, Washington, D. C.

Difference in Habit as a Basis for Specific Differentiation.

I have noticed a tendency lately with entomologists and others to make a difference in habit coequal with a difference in structure and coloration as regards species. My attention was drawn again to this matter by casually noticing that Pierce, Cushman, Hood and Hunter (Bull. No. 100, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C., p. 53, footnote, 1912) separate a braconid into two species—*Microbracon dorsata* and *mellitor* of Say—on the basis of a difference in social habit. They admit the two are alike structurally; in habit they differ in that *mellitor* is parasitic upon coleopterous larvae and *solitary*, while *dorsata* is parasitic upon lepidopterous larvae and *gregarious*. To my mind the separation has no reason for being. From a practical standpoint, suppose that an exploring party captured a number of Braconidae and turned them over to some Hymenopterologist

for identification. Not knowing the host or the habits of any of the species, doubtless if *dorsata* and *mellitor* were present, he could not do otherwise than consider them identical and as far as naming them is concerned it would be a matter of history only. Or, if he thought it was really true that a difference in habit mattered here, he would be unable to decide which is which. But this argument concerns practice only and inconvenience and trouble in taxonomy must be courted rather than avoided if there is a question of truth to be decided.

There can be no doubt that fundamental variation at first, in many cases at least, is psychic—the energy varies before the substance and is infinitely more variable than the latter. This psychic variation is inherited and forms habits and instincts as in the insects. In simple forms of life, the difference in habit is not expressed morphologically as much as in more complex forms, so that as we descend it becomes increasingly more difficult to separate species morphologically and a resort is made to their chemical nature and habits. But in insects this is not true. The psychic variations may finally become expressed morphologically and it is not until this is done that a specific difference arises. Keeping in mind the accepted meaning of *species,* we can point to many cases of adaptive habit in various species of insects. It is common and nowhere else more so than with insect parasites. A parasite of necessity has to adapt itself to the size of its host and I have no doubt that the gregarious habit of the Bracon on lepidopterous larvae is a case of this kind (obviously the difference in host has no bearing on the matter). Even the authors cited support my contention, for on page 66 (*l. c.*) occurs this sentence: "It appears possible that the constantly changing factors of nature cause the various species to be continually adjusting their habits to new environments and new hosts." And they cite examples of the adjustment to new hosts. An adaptive habit is certainly not a basis for specific differentiation and we certainly must consider the social or non-social habit of the Bracon as an adaptation to the size of its host. Even were it true that poly-embryony occurred

with the species and that it was proved able to alternate this mode of reproduction with the ordinary kind according to the nature of its host, this though a wonderful fact, would certainnot form a basis for specific differentiation. For the very definition of *species* would make it necessary that neither *mellitor* nor *dorsata* bred with one another or were identical in hereditary elements; for if this is so, the habits may vary infinitely without changing their essential specific unity. We know of so many instances in insects of great variability in habit of *known* specific units, and of so few or none where *known* specific units do not vary, that it would be extremely hazardous, to say the least, to base two species on the mere fact that a difference in habit was present. Before such a thing is done it will be necessary to change the definition of a species, and even that will not eliminate the fact that in nature there occur such things as a population of more or less definitely limited individuals which are all descendants from a common stock.

Seasonal Notes on Insects in Virginia.

At Blacksburg in 1901, butterflies had almost stopped flying by October 12th; by the 25th Diptera and Hymenoptera on the wing were becoming scarce; on November 9, however, swarms of Mycetophilidae were observed. Then Orthoptera were conspicuous; *Thyridopteryx* and *Callosamia* had cocooned. On March 20th following, the first butterly was observed, probably *Vanessa antiopa*. On April 11, the eggs of aphids were hatching; an adult of *V. antiopa* was observed and also several moths. On April 18, *Diastrophus nebulosus* was emerging (indoors) and the eggs of *Malacosoma americana* were hatching, the nests now appearing like cobwebs; the caterpillars then were about 6 mm. long and were feeding upon just opening buds. On April 22, *Carpocapsa pomonella* was observed depositing eggs (Professor Alwood). On the 30th, *Pieris rapae* was ovipositing onto young cabbage plants (2-3 inches high); eggs of *Coccinellidae* observed May 2, 1902, *Actias luna* had not emerged; *Malacosoma americana* now conspicuous in their nests. The following day, adult *Schisto-*

cerca americana were observed to be numerous in meadows, mating May 12; *Papilio turnus* observed on the wing. May 4, eggs of *Thyridopteryx ephemeraeformis* were hatching. May 13, *Nematus ribesii* was abundant in all stages of larval development on currants and gooseberries; Perlidae observed depositing eggs on grass stems along a stream. May 22, *Malocosoma* larvae full grown, cocooning on May 25. June 11, *Macrodactylus subspinosus* was present in numbers (since May 19). September 18, 1902, the larvae of *Ceratomia catalpae* were nearly full grown, pupating on September 22 and later. On March 14, 1902, an adult *Vanessa antiopa* was seen flying and a *Grapta;* pond life was then active.

References to Glossaries.

Some years ago in this journal (1905, pp. 105-108, 221-230), I gave a list of entomological glossaries and in 1902 I had commenced to write an entomological dictionary upon which I did a large amount of work before concluding that it was too much for one person to handle. A work of this kind is still badly needed and it will be necessary to consult all the vocabularies extant. The following references I find among my notes: Bull. 30, Univ. Montana, 1906, pp. 163-169. Frederick D. Chester, A Manual of Determinative Bacteriology, N. Y., 1901, pp. 381-386 (descriptive terms). Peter P. Good, A Materia Medica Animalia, Cambridge, Mass., 1833 (?), glossary of 54 pages. Glossary of Coccidae in second biennial Rep. Commissioners Horticulture of California, 1905-1906, p. 162. Eleanor A. Ormerod, A Textbook of Agricultural Entomology, London, 1892, edit. 2, pp. 229-231. Burt G. Wilder and Simon H. Gage, Anatomical Technology as Applied to the Domestic Cat., N. Y. and Chicago, 1882, pp. 10-45. Ed. André, Species des Hyménopterès d'Europe et d'Algérie enrichi &c., 1879, Beauve, tome premier, pp. CXLIX-CLXXXVII. These are but few.

Ptinobius dysphagae Ashmead, new species (Hym.).

In Entomological News, 1904, p. 300, I mention a chalcidoid parasite (supposedly) of *Dysphaga tenuipes* Hald. which had been identified as a new species of *Ptinobius* by William H. Ashmead and given the above name, from male specimens sent to him by myself from Blacksburg, Virginia, some time early in 1903. The species has never been described and is thus but a naked name. In order that the name should become valid, I give the following description of the species from

a specimen still in my possession, sent to me by Dr. Ashmead in 1903. It is a *Ptinobius* but the wings are not banded.

Male:—Length, about 4.25 mm. Dark metallic aeneous green, the wings hyaline, the abdomen, head, mesothorax and eyes with a soft, close, greyish yellow pile; vertex with coppery tinges, the abdomen darker, purplish black, its second segment green and glabrous. Venation, scape and pedicel, trochanters, knees, tips of tibiae and tarsi reddish brown. Hind femur somewhat swollen and with fine denticulation, distad with five teeth. Funicle and club black. Parapsidal furrows faint, half complete from cephalad. Postmarginal vein twice the length of the stigmal, three-fourths that of the marginal. Propodeum with a median carina and lateral carinae. Pronotum barely wider than long. *Sixth* segment of abdomen occupying more than the distal half of the surface, segment 2 deeply excavated at meson of caudal margin, exposing to view the extremely short third segment, the segments distad of 3 densely, pentagonally scaly, still denser on 6. Head and thorax finely, densely sculptured. Antennae 11-jointed, the club solid (though apparently obscurely 3-jointed). Funicle subcompressed, 7-jointed, the joints wider than long except the first; one large ring-joint which is slightly wider than long. Pedicel subglobate. Hind tibiae with two stout, unequal white spurs.

The specimen will be deposited into the collections of the United States National Museum as a type, and there should be several other males in the same collection but which I have not seen. (Accompanying the tagged specimens is a slide with first and third femora and the antennae.) The scape is darker above at tip. The front femur is distinctly swollen, obscurely denticulate beneath, more so above.

Geotaxis in Trichogramma minutum Riley (Hym.)

Once in 1904 I took a female of this species and placed it under a glass jar (10 x 10 cm.) over a clean sheet of white bristol board. The time was 5 P. M., and the jar was placed just in front of a window looking east and thus away from the direct source of light. The jar was nearly equally lighted on all sides. The insect immediately commenced to crawl up. After a second or two, the jar was inverted rather slowly but the upward motion of the insect continued, its course being gradually changed in a direction equal and opposite to that of the jar; thus, during the half revolution of the jar, the vertical movement of the *Trichogramma* was continued; when the jar

was half reversed, on its side, the insect was crawling up and around the side. When the reversal was complete, it was crawling toward the mouth of the jar and could easily have escaped. Obviously, its movements were geotactic. They were repeated as often as the jar was reversed. The side of the jar traversed was that turned toward the window.

This insect is often found on windows facing the light and then is always at the top of the pane, either resting there or else crawling upward as far as possible, falling down and repeating the same operation time after time. This is not only true for this species but for most of the species of its family, all or most of the Mymaridae and a very large number of other Chalcidoidea, Proctotrypoidea, Vespoidea, Apoidea and other Hymenoptera under similar conditions. A certain amount of positive phototaxis was also present, a turning toward greater brightness.

Diastrophus nebulosus (Hym.).

Galls of this species obtained at Annapolis, Maryland, March 17, 1901, were full of larvae; on April 8, the latter had pupated and emergence occurred late in April. Besides the cynipids *Ormyrus lobatus* Walker and a species of *Torymus* were reared, the identifications by Ashmead.

Trypeta solidaginis Fitch (Dip.).

A gall of this species taken from *Solidago* at Annapolis, Maryland, March 31, 1901, gave the adult on May the 9th following. The puparium is yellow, lighter between segments, that is the body is marked with alternating dark and lighter cross stripes. The gall measured over an inch. The adult was authoritatively identified by Coquillett.

Catolaccus Reared from a Gall (Hym.).

A species of *Catolaccus* was reared in May, 1901, from some cynipid gall on an unknown briar growing in a marsh at Annapolis, Maryland.

Cecidomyia farinosa Osten-Sacken in Maryland (Dip.).

About April 29, 1901, at Annapolis, I cut a twig containing a small yellow larva from a blackberry bush; the twig was swollen into an oval gall. The larva was taken out of the gall and placed into a watch glass, where it pupated on May 6 following; the pupa was yellow, turning to orange after several days and then to black when nearing ecdysis; the latter occurred on May 17 or after eleven days. Later, the galls were found to be common and usually to contain from three to four larvae. The species was identified by William H. Ashmead.

Polygnotus Not an Egg-parasite of Cecidomyia (Hym.).

In Entomological News, XIX, p. 352, Russell and Hooker record a proctotrypoid as parasitic upon the eggs of their *Cecidomyia foliora*. Mr. H. L. Viereck identified the parasites as *Polygnotus* and later sent them to me. From their size it would seem a physical impossibility for them to be true egg-parasites of the Cecidomyia.

A Note on Limenitus ursula (Lep.).

Several larvae obtained from wild plum (Annapolis, Maryland) on May 7, 1901, pupated on May 12, the butterflies emerging after ten and a half to eleven days.

A Few Notes on Lixus concavus Say (Col.).

At Annapolis, Maryland, the eggs of this species were very common in the stems of dock (*Rumex*), the third week in May, 1901. After some watching, the following observation was made on the manner of oviposition.* When first seen, the female was excavating a cavity into the plant with her jaws, her head toward the ground. After about forty minutes she turned hastily about, fitted the tip of the abdomen into the cavity and apparently without any exertion the egg was laid, occupying about five seconds; the cavity was then closed, but in what manner was not noted. The male was close by the whole time, usually upon the female's back, but not participating in the work. Some of the dock plants bore as many as four eggs. On January 7 a full-grown larva was encountered two and a half inches below the egg-scar; eggs were then still abundant. On June 26, at Blacksburg, Virginia, the adults were observed on cultivated rhubarb and later many egg-scars were found along the stems containing eggs; but in none of these infested plants could larvae ever be found. A gummy substance exuded by the rhubarb plant was often found over the egg-scar. On January 25 adults were observed mating.

Identification of Specimens.

The following desire to be added to the list of those willing to determine material from North America in their respective groups. (See this volume of the NEWS, pages 33, 35 and 85 for further information and for directions for sending specimens).

HEMIPTERA.—*Pentatomidae*: Dayton Stoner, Iowa City, Iowa; *Corixidae*: J. F. Abbott, Washington University, St. Louis, Missouri.

HYMENOPTERA.—*Pompilidae* and *Philanthidae*: Nathan Banks, East Falls Church, Virginia.

NEUROPTEROID INSECTS (except Odonata).—Nathan Banks, East Falls Church, Virginia.

[*See Ent. News XXIII, pp. 401 and 474. ED.]